

Application No.: 10/802024  
Docket No.: CL2556USNA

Page 2

### IN THE CLAIMS

1. (Currently amended) A process for polymerizing one or more vinylically-unsaturated monomers to form a polymeric product, wherein the process comprises: comprising

contacting said vinylically-unsaturated monomers with a chain transfer catalyst and a hydrogen atom donor molecule in the absence of conventional free radical initiators,

~~said process carried out~~ at a temperature from about room temperature to about 240 °C, ~~optionally in the presence of a solvent.~~

2. (Currently amended) ~~An improved~~ A process for polymerizing one or more vinylically-unsaturated monomers by contacting said vinylically-unsaturated monomers with a glyoximato-based cobalt chain transfer catalyst and a hydrogen gas in the absence of conventional free radical initiators, said process carried out at a temperature from about room temperature to about 240 °C, ~~optionally in the presence of a solvent,~~

wherein ~~the improvement is the selection of the catalyst~~ is selected from the family of hydrogen bridged bisglyoximato ligands.

3. (Currently amended) ~~An improved~~ A process for polymerizing one or more vinylically-unsaturated monomers by contacting said vinylically-unsaturated monomers with a cobalt chain transfer catalyst and a hydrogen gas in the absence of conventional free radical initiators, said process carried out at a temperature from about room temperature to about 240 °C, optionally in the presence of a solvent, said process further comprising

~~wherein the improvement is the addition of an electron donor.~~

4. (Currently amended) The process of Claim 1, 2 or 3, wherein the temperature is from about 50°C to 150°C.

5. (Currently amended) The process of Claim 1 wherein the chain transfer catalyst is selected from the group consisting of cobalt(II) and cobalt(III) chelates or and a mixture thereof.

Application No.: 10/802024  
Docket No.: CL2556USNA

Page 3

6. (Currently amended) The process ~~as recited in~~ of Claim 1, 2 or 3, wherein said process is a batch process.

7. (Currently amended) The process of Claim 1, 2 or 3, wherein said process is a semi-batch or starved feed process.

8. (Currently amended) The process of Claim 1, 2 or 3, wherein said process is a continuous process.

9. (Currently amended) The process of Claim 1, wherein the hydrogen atom donor is ~~chosen from the group consisting of~~ selected from dihydronaphthalene, silicon hydrides, tin hydrides, organometallic hydrides, benzylic alcohols, hydroquinones, alkyl ether hydroquinones, and benzhydrol.

10. (Currently amended) The process of Claim 9, wherein the hydrogen atom donor is dihydronaphthalene, triethylsilane, tributyltin hydride, hydroquinone, methyl ether hydroquinone, tetraethylcyclotetrasiloxane, methyldimethoxysilane, tetramethyldisiloxane, trimethylsilane, or benzhydrol.

11. (Currently amended) The process of Claim 1, 2 or 3 wherein the process is conducted in the presence of a solvent selected from the group consisting of ketones such as acetone, butanone, ~~pentanone and hexanone~~; alcohols such as isopropanol; amides such as dimethyl formamide; aromatic hydrocarbons such as toluene and xylene; ethers such as tetrahydrofuran and diethyl ether; ethylene glycol; glycol ethers, alkyl esters, ~~or mixed ester ethers such as monoalkyl ether-monoalkanoates~~; and mixtures thereof ~~of two or more solvents~~.

12. (Currently amended) The process of Claim 1, 2, or 3, wherein the ~~monomer in a homopolymerization or at least one or more of the monomers in a copolymerization~~ are monomer is selected from the group consisting of Class I monomers.

13. (Currently amended) The process of Claim 1, 2 or 3, wherein the ~~monomer in a homopolymerization or at least one or more of the monomers in a copolymerization~~ are monomer is selected from the group consisting of Class II monomers.

Application No.: 10/802024  
Docket No.: CL2556USNA

Page 4

14. (Currently amended) The process of Claim 1, 2 or 3, wherein the ~~monomer in a homopolymerization or at least one or more of the monomers in a copolymerization~~ are monomer is selected from Class I and Class II.

15. (Currently amended) The process of ~~Claims~~ claim 12 and or 14 wherein the resulting product is terminally unsaturated.

16. (Currently amended) The process of Claim 2 or 3, wherein the hydrogen pressure is from 0.01 to 100 atmospheres (~~1 to 10,000 kPa~~).

17. (Currently amended) The process of Claim 2 or 3, wherein the hydrogen pressure is from 1 to 10 atmospheres (~~100 to 1000 kPa~~).

18. (Currently amended) The process of Claim 3 wherein the electron donor is selected from amines, nitrogen heterocycles ~~such as pyridines, imidazole, pyrrole, pyrimidine, benzpyrazole,~~ and phosphorus donor ligands.

19. (Currently amended) The process of Claim 3 wherein the electron donor is selected from nitrogen heterocycles ~~such as pyridines, imidazole, pyrrole, pyrimidine, benzpyrazole,~~ and phosphines.

20. (Currently amended) ~~The A product produced~~ by the process of ~~Claims Claim~~ 1, 2 or 3.

21. (Currently amended) ~~The use of the products of A product of~~ Claim 20 is selected from: non-metallic chain transfer agents, ~~components and intermediates in the production of graft copolymers,~~ non-aqueous dispersed polymers, block copolymers, microgels, star polymers, branched polymers, structured polymers and ladder polymers.

Application No.: 10/802024  
Docket No.: CL2556USNA

Page 5

22. (Currently amended) ~~The use of the products of~~ A product of Claim 20 ~~is selected from:~~ non architectural coatings; automotive finishes, including high solids, aqueous and solvent-based finishes; high-build maintenance finishes and other paints; printing inks including ink jet inks and UV/EB curable inks; multilayer coatings; varnishes; crosslinking agents; defoamers; deaerators; wetting agents; substrate wetting additives; surface control additives; reactive surface control additives; hydrophobing agents; antigraffiti agents; nucleating agents; personal care products; masks for screen printing; dental filling materials; adhesives; lubricants; oil drilling fluids; adhesion promoters; coupling agents; dispersants ~~(e.g., for pigments)~~; grinding agents; solder masks; tackifiers; leveling agents; artificial stone and marble; impact modifiers; compatibilizers; plasticizers; caulks; sealants; drug delivery agents; electronic materials; processing aids; antistatics; softeners; antioxidants; UV stabilizers; dispersion media; release agents; ion exchange resins ~~or~~ and membranes; molded objects; extruded objects; chain transfer reagents; photopolymerizable materials; and etch or permanent resists for printed electronic circuits.

23. (Currently amended) ~~The use of the products of~~ A product of Claim 20 ~~is selected from:~~ non polyurethanes, polyurethane foams, polyurethane adhesives and polyurethane finishes.

24. (New) The process of claim 1, wherein said process is carried out in the presence of a solvent.

25. (New) The process of claim 11, wherein said ketone is selected from acetone, butanone, pentanone and hexanone.

26. (New) The process of claim 11, wherein said alcohol is isopropanol.

27. (New) The process of claim 11, wherein said amide is dimethyl formamide.

28. (New) The process of claim 11, wherein said aromatic hydrocarbon is selected from toluene and zylene.

29. (New) The process of claim 11, wherein said ether is selected from tetrahydrofuran and diethyle ether.

Application No.: 10/802024  
Docket No.: CL2556USNA

Page 6

30. (New) The process of claim 11, wherein the mixed ester ether is a monoalkyl ether monoalkanoate.